

LQB681 Biochemical Research Skills



To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 2 2015	view
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Unit Outline: Semester 2 2015

QUT code:	LQB681
Credit points:	12
Prerequisite(s):	LQB381 or LSB308. Students with equivalent study can apply for a requisite waiver
Equivalent(s):	LSB607
Coordinator:	Dr Ron Epping
Phone:	3138 2576
Fax:	3138 1534
Email:	r.epping@qut.edu.au

Rationale

In the real world, the design and completion of successful research and/or business projects demand that individuals gather information, solve problems, work effectively as a part of a team and analyse and communicate results in a critical manner. This unit offers opportunities for you to develop these skills that are valued highly by potential employers and research project leaders. This unit is a capstone biochemistry unit designed to prepare you as a prospective graduate for independent and group research.

Aims

The aim of this unit is to assist you to demonstrate and strengthen a number of generic research skills in a mentored problem-based learning environment that mirrors a real-world research team and the challenges that they face.

Learning Outcomes

On completion of this unit, you should:

1. Be able to apply problem-solving skills to project design and data interpretation.
2. Develop your abilities to work and contribute in a significant way to the organisation and function of a collaborative research team.
3. Consolidate your information literacy skills in the areas of information access, retrieval and evaluation, by designing efficient search strategies.
4. Improve oral and written communication skills through individual presentations, group submissions and as a contributor to on-line discussions.
5. Be able to design, modify and successfully execute an experimental protocol, including reagent preparation, programming and execution of software for a sophisticated automated chromatography system.

Content

Critical Thinking Workshops focusing on Biochemical Research Skills and related Problems:

- Information retrieval strategies
- Principles of protein extraction techniques
- Skills required for successful research teams
- Chromatography: Fast Protein Liquid Chromatography (FPLC) programming
- Solving Problems with Gel Electrophoresis

Group Laboratory Project:

- Project planning
- Reagent preparation
- Biomolecular fermentation, isolation and/or purification
- Enzyme purification
- Biomolecular analysis using appropriate advanced level biochemical assays including enzyme assays and SDS-polyacrylamide gel electrophoresis

Approaches to Teaching and Learning

The unit comprises a series of critical thinking workshops and a closely mentored practical project where you work in a group to purify and characterise an enzyme from intact tissue. The unit has four hours of

formal student contact per week however additional off-campus research & planning also will be required.

There will be no formal lectures or examinations. You will spend:

- Approx 15 hours participating in critical thinking workshops designed to strengthen generic skills in information retrieval, group project research and problem solving.
- Approx 10 hours contributing to class discussion sessions that will allow you to discuss the principles and limitations of contemporary biochemical techniques as they apply to your team project.
- Approx 35 hours engaged in formal laboratory project work, coping with unforeseen developments and using teamwork to solve problems. (A minimum of 10-15 hours of additional team meeting/planning outside of timetabled hours is realistic for this unit).
- Approx 1 hour involvement in student presentations throughout the semester.

The unit integrates a number of specialist biochemical techniques including centrifugation, advanced liquid chromatography, electrophoresis and spectrophotometry using state-of-the-art equipment. In addition, workshops facilitated by the Unit Coordinator will provide you with an overview of options available for any particular situation and this is supported by comprehensive on-line resources and academic mentoring to support your studies and project work. The unit affords you a truly unique and rewarding laboratory experience.

Assessment

Teams commence operation in week 1 and the first assessment item is completed by week 2, hence enrolment in this unit after week one is discouraged.

On a weekly basis you will be required to submit material in the form of assessable items, reagents lists and contribute to on-line discussions using the unit's Blackboard site.

Your grade for this unit will be determined by continuous assessment based upon both group and individual exercises. Components of the assessment will be evaluated by the academics, the laboratory technician and colleagues in your project team. 75% of your final assessment will be allocated by week 13.

Formative assessment and feedback is an intrinsic feature of the design of this unit.

The following assessment scheme is provided as a guide only. Weightings are negotiated with you in week 1.

In this unit you will receive weekly feedback and advice on project progress from academics and demonstrators throughout the project, and the summative assessment items 1,3 and 4 below are returned to students throughout the semester.

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date,

you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Project (applied)

Description: Your contributions to teamwork, leadership and organisation of team activities will be assessed constantly throughout the semester. You also will be required to complete exercises for assessment on a regular basis. Some exercises are evaluated as group submissions and others as your individual submission. Exercises will include the generation of a flow diagram for the protocol created by your team, and the design of software to perform FPLC on your enzyme preparation. The precise portfolio of activities and assessment weightings may vary each year. The current portfolio and weightings will be available from the unit's Blackboard site. Your group also must provide evidence of project planning skills on a regular basis through the provision of detailed project plans and weekly team requests for reagents and equipment necessary to execute your protocol. *Formative and Summative*.

Relates to objectives: 1-5

Weight: 45

Internal or external: Internal

Group or individual: Group with Individual Component

Due date: Throughout Semester

Assessment name: Report

Description: You must submit a final scientific report that summarises the methods and outcomes of the semester-long project either as an individual submission (single author), a group report (all members in your team share authorship) or any combination of team members as authors. *Summative*.

Relates to objectives: 1-5

Weight: 25

Internal or external: Internal

Group or individual: Group with Individual Component

Due date: Week 14

Assessment name: Problem Solving Task

Description: You will be assessed throughout the semester on your ability to think critically and scientifically. You will participate in several problem solving exercises including critical evaluation of project proposals and rectifying problems commonly encountered when using Polyacrylamide Gel Electrophoresis (PAGE). You also will be required to make quality contributions regularly throughout the semester to a number of on-line activities enabled through the use of Blackboard class discussion forums. *Formative and*

Summative.

Relates to objectives: 1

Weight: 15

Internal or external: Internal

Group or individual: Individual

Due date: Throughout Semester

Assessment name: Annotated Bibliography

Description: You will receive instruction for effective searching of bibliographic databases and you will search the scientific literature for strategies available for the purification of your enzyme. You will carefully document your efforts and submit your search strategies, how they were refined and your search outcomes for assessment. *Summative.*

Relates to objectives: 3

Weight: 15

Internal or external: Internal

Group or individual: Individual

Due date: Week 5

Academic Integrity

QUT is committed to maintaining high academic standards to protect the value of its qualifications. To assist you in assuring the [academic integrity](#) of your assessment you are encouraged to make use of the [support materials and services](#) available to help you consider and check your assessment items. Important information about the university's approach to academic integrity of assessment is on your unit Blackboard site.

A breach of academic integrity is regarded as Student Misconduct and can lead to the imposition of penalties.

Resource materials

Required Text Books

There is no prescribed text for this unit, although students considering postgraduate work in this area are encouraged to consider the purchase of one of the following reference texts:

- Bonner, PLR (2007) Protein Purification. The Basics. 1st edition. Taylor & Francis, Publ. ISBN 978-0-415-38511-4 OR

- Scopes RK (1993) Protein Purification. Principles and Practice, 3rd edition, Springer Publ. ISBN 0-387-94072-3

Risk assessment statement

Personal Protective Equipment:

1. Laboratory coat - 100% cotton or polyester/cotton mix (65% polyester is max. allowable).
2. Safety eye protection glasses - selected and used in accordance with AS1336, AS1337 and AS 1338.

Risk Assessment Statement

This unit includes a laboratory component. In order that you become proficient in necessary practical skills, you will be trained in the handling of equipment, materials and specimens normally associated with this discipline. You are required to complete an online health and safety quiz prior to entry to the laboratory. A passing score of 9/10 is required and will be checked prior to entry to the first laboratory. You may resit the quiz until this score is achieved. You are referred to the university's health and safety web site for further information.

If you have an underlying health condition you are encouraged to consult the lecturer in charge of the unit, as you may be required to take additional precautions on occasions.

Disclaimer - Offer of some units is subject to viability, and information in these Unit Outlines is subject to change prior to commencement of semester.

Last modified: 23-Jul-2015



ENB322 Biofluids

To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 2 2015	view
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Unit Outline: Semester 2 2015

QUT code:	ENB322
Credit points:	12
Prerequisite(s):	ENB201 or ENB221
Corequisite(s):	Nil.
Antirequisite(s):	Nil.
Equivalent(s):	MMB362
Other requisite(s):	Nil.
Assumed knowledge:	Nil.
Coordinator:	Professor Zhiyong Li
Phone:	3138 5112
Fax:	3138 8381
Email:	zhiyong.li@qut.edu.au

Rationale

The mechanics of fluids in biological and biomedical systems differs from industrial applications as most of the fluids encountered exhibit viscosity that changes in a non-linear manner with shear rate. It is therefore necessary, when designing a second course in the mechanics of fluids for medical engineers, to examine the particular properties of the fluids that might be encountered and to introduce techniques to analyse their behaviour. It is also important to consider how the properties of the fluids relate to their biological function and the relevance of their properties to the design of associated equipment.

Aims

The aim of this unit is to introduce you to the characteristics of real flows and, in particular, to give you an appreciation of biofluids. This requires an understanding of the basic principles of the mechanics of viscous fluids and techniques to analyse their behaviour and how they interact with the surfaces of implants.

Learning Outcomes

On completion of this unit you should be able to:

1. Understand the basic concepts and theories used to analyse the flow properties of real fluids.
2. Solve simple numerical problems related to the flow of biofluids.
3. Retrieve, evaluate and use relevant information in order to communicate knowledge of biofluid mechanics to others not familiar with the subject.
4. Analyse and explain the properties of biofluids in relation to their physiological function.
5. Analyse the shear stresses caused by boundary layers that are produced when biofluids flow over surfaces.
6. Work efficiently on your own and as part of a group undertaking assignments and written reports.

Content

Introduction to the question, "What is a Biofluid?" Viscosity; Flow Properties of Blood; Reynold's Number

Assignment on medical devices that interact with biofluids

Laminar Flow between flat plates; Laminar flow through a circular pipe; Measurement of Viscosity

Laminar flow of a non-Newtonian liquid in a circular pipe; Reynold's equation; Application of Reynold's equation to a plane inclined slider bearing

Turbulent flow

Dimensional analysis

Modeling and physical similarity

Friction and wear

Introduction to lubrication; lubrication of biological joints

Biofluid pumps

Boundary layers; effect of pressure gradient on boundary layers

Laboratory activities with biofluids and devices

Approaches to Teaching and Learning

Teaching Mode:

Hours per Week: 3-5 hrs/wk

Lectures: 2 hrs/wk

Tutorials: 1hr/wk

Laboratories/Practicals: 2 hrs/wk (weeks 3-7)

Formal lectures will introduce you to the basic building blocks of knowledge required to characterise and model the flow of real fluids. Practical examples will be used to illustrate these principles. Tutorial exercises will give you practice at applying the knowledge and principles outlined in the lectures. Worked solutions will be made available progressively during the semester. You will undertake a group assignment to develop your ability to access information, increase your understanding and communicate your findings. You will submit a report and present a seminar on the assignment. Laboratory classes will illustrate and highlight practical applications of the theory and provide an opportunity for you to operate real devices of the kind that you may use and design in your future career.

Assessment

Assessment will be based on the written review and seminar, laboratory reports and the end-of-semester examination.

Formative feedback will be provided in tutorials, laboratories and on draft laboratory reports. Summative assessment will be based on a final laboratory report, the written review and the seminar presentation.

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date, you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Examination (Theory)

Description: You will be required to solve problems concerning the flow of biofluids and their interaction with devices and surfaces and interpret the function of biofluids in relation to their physiological function.

Relates to objectives: 1. Understand the basic concepts and theories used to analyse the flow properties of real fluids 2. Solve simple numerical problems related to the flow of biofluids 4. Analyse and explain the properties of biofluids in relation to their physiological function 5. Analyse the shear stresses caused by boundary layers that are produced when biofluids flow over surfaces

Weight: 60

Internal or external: Internal

Group or individual: Individual

Due date: Exam Period

Assessment name: Written Review & Presentation

Description: You will be required to review the history of different kinds of medical devices that interact with biofluids. This is a group exercise to write a written review and to present the review orally to the class and all members of the group receive the same mark.

Relates to objectives: 3. Retrieve, evaluate and use relevant information in order to communicate knowledge of biofluid mechanics to others not familiar with the subject 4. Analyse and explain the properties of biofluids in relation to their physiological function 6. Work efficiently on your own and as part of a group undertaking assignments and written reports.

Weight: 20

Internal or external: Internal

Group or individual: Group

Due date: Wk 9

Assessment name: Laboratory Report

Description: During the semester you will undertake three laboratory classes concerning the flow of real fluids and biomedical devices. You will write a formal report on each and receive written feedback. You will then submit a final good copy of one report that will be marked.

Relates to objectives: 1. Understand the basic concepts and theories used to analyse the flow properties of real fluids 4. Analyse and explain the properties of biofluids in relation to their physiological function 6. Work efficiently on your own and as part of a group undertaking assignments and written reports.

Weight: 20

Internal or external: Internal

Group or individual: Individual

Due date: Wks 3 - 9

Academic Integrity

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Resource materials

Textbook:

Douglas JF, Gasiorek JM & Swaffield JA,
Fluid Mechanics,
Pitman International Press.

References:

Rubenstein DA, Yin W, Frame MD
Biofluid Mechanics

Academic Press, Elsevier, Oxford, 2012

Chimiel, H, and Walitza, E,

On the Rheology of Blood and Synovial Fluids, Research Studies Press, A Division of John Wiley & Sons Ltd, 1980.

Fung YC,

Biomechanics - Motion, Flow, Stress and Growth, Springer-Verlag, 1990

Fung YC,

Biomechanics - Mechanical Properties of living Tissues,
2nd Ed., Springer-Verlag, 1993

Fung YC,

Biomechanics - Circulation,
2nd Ed., Springer-Verlag, 1996

Bronzino JD, Ed,

The Biomedical Engineering Handbook,
CRC Press, 1995

Brown BH, Smallwood RH, Barber DC, Lawford & Hose DR,

Medical Physics and Biomedical Engineering,
Institute of Physics Publishing, 1999

Interest:

Fung YC, Ed, Introduction to Bioengineering, World Scientific, 2001
(Selection of recent publications - latest thinking in the area)

Online Resource:

Blackboard-ENB322-Biofluids

Risk assessment statement

You will undertake lectures and tutorials in the traditional classrooms and lecture theatres. As such, there are no extraordinary workplace health and safety issues associated with these components of the unit.

During the laboratory classes you will be exposed to electrical and mechanical machinery under the supervision of technical and academic staff. In any laboratory practicals you will be advised of requirements of safe and responsible behaviour and will be required to wear appropriate protective items (e.g. closed shoes).

You will undergo a health and safety induction before the commencement of the practical sessions and will be issued with a safety induction card. If you do not have a safety induction card you will be denied access to laboratories.

Disclaimer - Offer of some units is subject to viability, and information in these Unit Outlines is subject to change prior to commencement of semester.

Last modified: 28-Apr-2014

LSN684 Medical Biotechnology 2



To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 2 2015	view
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Unit Outline: Semester 2 2015

QUT code:	LSN684
Credit points:	12
Prerequisite(s):	LSN101 and LSN102
Corequisite(s):	Nil.
Antirequisite(s):	LQB584
Equivalent(s):	LSN609
Other requisite(s):	Nil.
Assumed knowledge:	A background understanding of Cell and Molecular Biology as provided in LQB383, LQB483 and LQB584.
Coordinator:	Dr Kerry Manton
Phone:	3138 6214
Email:	kerry.manton@qut.edu.au

Rationale

The development of diagnostics and therapeutics for safe and effective clinical use is a complicated process filled with commercial, regulatory and ethical compliances. This advanced level unit will enable you to understand this process as it relates to emerging treatments of health problems especially within the South-East Asia region. In this unit you will further develop your scientific research and analytical skills to design innovative solutions for improving modern biotechnology. This unit has a substantial practical focus and will prepare you for subsequent involvement in medical research and/or the biotechnology industry.

Aims

The aim of this unit is to enable you to acquire a thorough understanding of current and emerging strategies for therapeutic interventions in the treatment of disease. In addition, you will further develop your research and analytical skills to enable you to solve emerging health problems in the local region.

Learning Outcomes

On successful completion of this unit, you will be able to:

1. Describe the applications, risks and ethical and regulatory limitations of current and emerging biotechnology based therapeutics in treating complex human disease systems.
2. Demonstrate advanced problem solving, information retrieval and critical analysis skills to identify novel solutions for improving biotechnology based therapeutics in treating complex human disease systems.
3. Construct robust experimental aims, methods and hypotheses, to enable you to collect, interpret, validate and communicate scientific data.

Content

The content of this unit includes:

Cell-based therapies

- tissue transplantation,
- regenerative medicine,
- stem cell therapies,
- cellular immunotherapies.
- Molecular-based therapies
- vaccines,

Clinical trials

- ethical and regulatory obligations.

Drug/clinical therapy discovery pipeline

Industry case studies.

Approaches to Teaching and Learning

This unit is focussed on applying your knowledge of the biotechnology industry to develop novel and innovative solutions for 'real-world' problems. Lectures (often delivered by industry professionals) will focus on the problems and success in the local biotechnology industry.

The practical component of this unit will comprise a research project where you will be expected to develop your own hypotheses and experimental protocols. You will conduct your experiments in a wet-lab setting, collect and analyse the data and draw scientific conclusions.

Tutorials will extend the traditional teaching format and provide you with opportunities for the development of advanced problem solving, information retrieval and critical analytical skills. The tutorial assignment is delivered early in the semester (and follows on from the early-semester lectures) to be worked on at the discretion of the student and is due mid-semester. Students will be given the opportunity for collaborative feedback with their peers and/or teaching staff.

The unit concludes with a viva voce assessment that will allow you to further demonstrate your strengths in scientific analysis and innovative solution development.

Assessment

Assessment items and standards of attainment are designed to emulate techniques and processes in common use within the biotechnology and medical research industries. These assessments will facilitate individual feedback on critical thinking, technical competence and statutory compliance.

Formal assessments will provide you with feedback on critical thinking, technical (laboratory) competence and statutory compliance.

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date, you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Industry Case Study

Description: You will develop and communicate (through a written assignment and oral presentation) novel solutions to improve the clinical effectiveness of biotechnology derived cellular therapies. All assignments will be checked for plagiarism using the QUT's safe assign content matching software.

Relates to objectives: 1 and 2.

Weight: 35

Internal or external: Internal

Group or individual: Individual

Due date: Week 6-8

Assessment name: Laboratory Research Project

Description: Laboratory Notebook: You are required to maintain and submit good laboratory practice standard workbooks documenting your aims, methods, results and scientific analysis of your laboratory experiments. This will enable ongoing assessment on your research capacity within a wet-laboratory.

Relates to objectives: 3.

Weight: 50

Internal or external: Internal

Group or individual: Individual

Due date: Ongoing

Assessment name: Viva voce

Description: Verbal explanation of your understanding of a medical biotechnology/clinical trial scenario that has been discussed within the unit.

Relates to objectives: 1, 2 and 3.

Weight: 15

Internal or external: Internal

Group or individual: Individual

Due date: End of semester

Academic Integrity

QUT is committed to maintaining high academic standards to protect the value of its qualifications. To assist you in assuring the [academic integrity](#) of your assessment you are encouraged to make use of the [support materials and services](#) available to help you consider and check your assessment items. Important information about the university's approach to academic integrity of assessment is on your unit Blackboard site.

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Resource materials

There are no set texts or references. The nature of the content of this unit dictates that you continuously search for current material. You will be referred to relevant, particularly Web-based material and sites as appropriate.

Risk assessment statement

This unit includes a laboratory component. In order that you become proficient in necessary practical skills, you will be trained in the handling of equipment, materials and specimens normally associated with this discipline. You are required to complete an online health and safety quiz prior to entry to the laboratory. A passing score of 9/10 is required and will be checked prior to entry to the first laboratory. You may retake the quiz until this score is achieved. You are referred to the university's health and safety web site <http://www.hrd.qut.edu.au/healthsafety/index.jsp> for further information.

If you have an underlying health condition you are encouraged to consult the lecturer in charge of the unit, as you may be required to take additional precautions on occasions.

Disclaimer - Offer of some units is subject to viability, and information in these Unit Outlines is subject to change prior to commencement of semester.

Last modified: 12-Jun-2015



PCN705-1 Research Methodology

To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 2 2015	view
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Unit Outline: Semester 2 2015

QUT code:	PCN705-1
Credit points:	6
Coordinator:	John McMurtrie
Phone:	3138 1220
Email:	j.mcmurtrie@qut.edu.au

Rationale

To enable the student to develop the theoretical and communication skills required for the successful conduct of a research project.

Aims

The aims of this unit will vary depending upon the research topic chosen and will be identified in consultation with the Unit Coordinator.

Learning Outcomes

On successful completion of this unit the student should:

- Have a complete grasp of the relevant literature for the research project and have produced a written report in a suitable form for inclusion in the thesis.
- Have presented at least two seminars on his research and the literature associated with it.

Content

A guided program of literature surveys to provide the background information for the research project. At least two oral presentations covering this information and the contribution of his research to the increase in knowledge in the area. With the approval of the course coordinator, second seminar may be delayed until the second year of the program.

Approaches to Teaching and Learning

Supervision of the literature survey by academic staff. Attendance and active participation in the School's seminar program will assist students in the technique of seminar presentation. Feed back from experienced academics will be provided on the seminar presentations.

Assessment

The assessment in this unit will be negotiated in terms of research topic, scope, methodology and structure. Students will liaise with the Unit's academic staff to identify completion timelines. For more information please contact the Unit Coordinator.

Feedback will be provided via verbal and online consultations with supervisory and/or academic staff.

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date, you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Student negotiated assessment

Description: This assessment will include the scheduling of examination of the written literature review by the supervisor and two seminars (dates to be negotiated by student and assessors) will be assessed by a panel of academics.

Relates to objectives: All.

Weight: 100

Internal or external: Internal

Group or individual: Individual

Due date: Ongoing

Academic Integrity

QUT is committed to maintaining high academic standards to protect the value of its qualifications. To assist you in assuring the [academic integrity](#) of your assessment you are encouraged to make use of the [support materials and services](#) available to help you consider and check your assessment items. Important information about the university's approach to academic integrity of assessment is on your unit Blackboard site.

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Resource materials

Texts:

Not Applicable.

Risk assessment statement

There are no out of the ordinary risks associated with this unit.

Disclaimer - Offer of some units is subject to viability, and information in these Unit Outlines is subject to change prior to commencement of semester.

Last modified: 23-Jan-2014



PCN520 Project (Full-time)

To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 2 2015	view
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Unit Outline: Semester 2 2015

QUT code:	PCN520
Credit points:	48
Coordinator:	Dr Andrew Fielding
Phone:	3138 5325
Email:	a.fielding@qut.edu.au

Rationale

Modern healthcare has seen rapid advances in technology that have had a significant impact in the way patients are diagnosed and treated. The medical physicist is increasingly expected to carry out translational research and implementation of new technologies and techniques into clinical practice. This unit will enable you to deepen your knowledge of current research in medical physics as well as further develop the necessary practical and analytical skills to effectively prepare you for a career in medical physics.

Aims

This unit aims to give you the necessary skills and knowledge to design, develop, conduct, complete and communicate the results of a small-scale research project that will fully conform to academic scientific standards and respond to professional requirements.

Learning Outcomes

On completion of this unit you will be able to:

1. Develop skills in the techniques required to conduct independent research in an area of medical physics.
2. Exhibit skills of information or data collection.
3. Develop and improve your skills in independent thinking and critical analysis.
4. Organise, analyse and interpret evidence to reach a meaningful conclusion.
5. Report research findings in written and oral forms.

Content

The project will be different for every student and will be chosen after discussion with prospective supervisors and the unit coordinator.

Approaches to Teaching and Learning

A supervised program of research in a relevant area of medical physics.

Assessment

The assessment will allow you to demonstrate that you have developed the skills for carrying out research in the discipline of medical physics and that you are able to effectively communicate the outcomes of the research project to the appropriate stakeholders.

Feedback will be provided by examiners and peers. The project supervisor will give feedback during the preparation of the research paper, e-poster and presentations.

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date, you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Presentation (Oral or Group)

Description: A final oral presentation of your research project work in the format that might be expected at a medical physics conference.

Relates to objectives: 1,2,3,4 and 5

Weight: 20

Internal or external: Internal

Group or individual: Individual

Due date: end of semester

Assessment name: Poster Presentation

Description: An e-poster giving a graphical summary of your research project in a style that would be required at a scientific conference.

Relates to objectives: 1,2,3,4 and 5

Weight: 20

Internal or external: Internal

Group or individual: Individual

Due date: end of semester

Assessment name: Research Paper

Description: written presentation of your research project work in the style required for a peer-reviewed journal in the medical physics discipline.

Relates to objectives: 1,2,3,4 and 5

Weight: 60

Internal or external: Internal

Group or individual: Individual

Due date: end of semester

Academic Integrity

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Resource materials

A list of appropriate resources will be made available on the Blackboard site.

Risk assessment statement

Attention will be drawn to relevant workplace health and safety issues by the project supervisor who will carry out a risk assessment.

Disclaimer - Offer of some units is subject to viability, and information in these Unit Outlines is subject to change prior to commencement of semester.

Last modified: 29-Oct-2014

PCN705-2 Research Methodology



To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 2 2015 ▼	view
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Unit Outline: Semester 2 2015

QUT code:	PCN705-2
Credit points:	6
Coordinator:	John McMurtrie
Phone:	3138 1220
Email:	j.mcmurtrie@qut.edu.au

Rationale

To enable the student to develop the theoretical and communication skills required for the successful conduct of a research project.

Aims

The aims of this unit will vary depending upon the research topic chosen and will be identified in consultation with the Unit Coordinator.

Learning Outcomes

On successful completion of this unit the student should:

- Have a complete grasp of the relevant literature for the research project and have produced a written report in a suitable form for inclusion in the thesis.
- Have presented at least two seminars on his research and the literature associated with it.

Content

A guided program of literature surveys to provide the background information for the research project. At least two oral presentations covering this information and the contribution of his research to the increase in knowledge in the area. With the approval of the course coordinator, second seminar may be delayed until the second year of the program.

Approaches to Teaching and Learning

Supervision of the literature survey by academic staff. Attendance and active participation in the School's seminar program will assist students in the technique of seminar presentation. Feed back from experienced academics will be provided on the seminar presentations.

Assessment

The assessment in this unit will be negotiated in terms of research topic, scope, methodology and structure. Students will liaise with the Unit's academic staff to identify completion timelines. For more information please contact the Unit Coordinator.

Feedback will be provided via verbal and online consultations with supervisory and/or academic staff.

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date, you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Student negotiated assessment

Description: This assessment will include the scheduling of examination of the written literature review by the supervisor and two seminars (dates to be negotiated by student and assessors) will be assessed by a panel of academics.

Relates to objectives: All.

Weight: 100

Internal or external: Internal

Group or individual: Individual

Due date: Ongoing

Academic Integrity

QUT is committed to maintaining high academic standards to protect the value of its qualifications. To assist you in assuring the [academic integrity](#) of your assessment you are encouraged to make use of the

[support materials and services](#) available to help you consider and check your assessment items. Important information about the university's approach to academic integrity of assessment is on your unit Blackboard site.

A breach of academic integrity is regarded as Student Misconduct and can lead to the imposition of penalties.

Resource materials

Texts:

Not Applicable.

Risk assessment statement

There are no out of the ordinary risks associated with this unit.

Disclaimer - Offer of some units is subject to viability, and information in these Unit Outlines is subject to change prior to commencement of semester.

Last modified: 23-Jan-2014

IFN001 Advanced Information Research Skills



To view more information for this unit, select Unit Outline from the list below. Please note the teaching period for which the Unit Outline is relevant.

Unit Outline: Semester 1 2015

view

Unit Outline: Semester 1 2015

QUT code:	IFN001
Credit points:	4
Assumed knowledge:	Students are expected to have completed Study Smart or already possess the capacities outlined in Study Smart before undertaking AIRS
Coordinator:	Ms Jennifer Hall, Mr Marvin Van Prooijen
Phone:	3138 1426, 3138 2605
Email:	jr.hall@qut.edu.au, m.vanprooijen@qut.edu.au

Rationale

IFN001 is a 4 credit point mandatory coursework unit for students in IF49, Doctor of Philosophy, and for students in a number of Masters by Research courses. It provides preparation for research at QUT by way of a systematic introduction to high level research skills and knowledge within the context of students' fields of research. The unit enables students in their work for the Stage 2 milestone: research proposal completion'. IFN001 is designed to lay the foundations of independent research, critical evaluation of information and effective management of information and research data, which will be further developed during the progression of a research degree. These skills are essential for scholars operating in today's data intensive research environment and facilitate the capacity for life-long learning.

Aims

The aim of this unit is to develop your abilities to efficiently and effectively conduct advanced information search, retrieval, evaluation, management and usage, and to develop advanced academic skills essential for original research.

Learning Outcomes

To successfully complete this unit you will:

1. Demonstrate an understanding of the theory of advanced search and evaluative strategies to efficiently yield appropriate resources to create original research.
2. Apply appropriate data management strategies to organise and utilize your information proficiently, ethically and legally.
3. Identify strategies to ensure best practice in the use of information sources, information technologies, information access tools and investigative methods.

The curriculum develops information skills in alignment with the Australian and New Zealand Information Literacy Framework (2004). The unit content lays the foundations of the graduate capabilities within the Australian Qualification Framework (AQF): Level 10 required at the completion of a higher research degree.

Content

The unit develops high level research skills and knowledge for researchers. The content covers formulating a good research question, advanced search strategies, sourcing and evaluating quality literature, bibliographic and data management, note-taking strategies, citation analysis and research impact academic integrity and strategies to publish, network, collaborate, and gain funding.

Approaches to Teaching and Learning

Students for whom the unit is mandatory are automatically enrolled on commencement of research activity.

- The mode of engagement for learning is flexible. You can attend workshops in person, or work through the modules online, use the learning resources and select or add as needed.
- There is one required assessment task which is aligned with the learning activities.
- This is a self-directed unit in which you organise and take responsibility for completing online or in-person learning activities in order to complete your assessment as soon as able.

IFN001 is offered in a blended learning mode, based around the [IFN001 AIRS website](#), including:

- Modules: Twelve (12) online modules.
- Workshops: Four on-campus workshops that complement the online modules and include active, peer-learning opportunities.
- Learning Resources: Online learning resources for each module, including workshop PowerPoints, lecture recordings, assessment questions and unit readings.
- Assessment: The assignment template, the marking criteria sheet, completion guidelines and submission instructions.
- Help: Contacts for help by email and for consultation, accompanied frequently answered questions.

The workload for this 4 credit point unit comes to an approximate total of 48 hours, divided between a selection of modules, workshops, reading and completion of the assignment. A full time student can expect to complete the unit in three months. You can expect to spend 24 hours participating in online or in-person learning activities and reading and 24 hours writing your resource log assessment.

Assessment

The assessment in this unit is a Resource log, designed in order to allow you to demonstrate your learning in this unit to achieve a final grade. For the assessment resources and information, see the Assessment section of the AIRS website.

Feedback to students

Feedback in this unit is provided to you in the following ways:

- Informal: Active learning activities in workshops are aligned with the assessment questions to support work and progress towards completion of the assignment.
- Direct: to individual students via the AIRS email and with Liaison Librarians available for consultation to clarify requirements of assessment questions.
- Formal: an assessment grading sheet mapped to criteria sheets
- Indirect: to the whole cohort and feedback from peers

Assessment Submission and Extensions

Assessment items submitted after the due date without an approved extension will not be marked and will receive a grade of 1 or 0%. If special circumstances prevent you from meeting the assessment due date, you can [apply for an extension](#). If you don't have an approved extension you should submit the work you have done by the due date and it will be marked against the assessment criteria. QUT's assessment submission requirements reflect the expectations of professional practice where you will need to meet deadlines.

Assessment name: Resource log

Description: The Resource Log is designed to assess your understanding and application of the skills and concepts learned in the unit, including providing a record of resources and strategies for future reference.

Relates to objectives: 1, 2 and 3.

Weight: 100

Internal or external: Both

Group or individual: Individual

Due date: 6 months

Academic Integrity

QUT is committed to maintaining high academic standards to protect the value of its qualifications. To assist you in assuring the [academic integrity](#) of your assessment you are encouraged to make use of the [support materials and services](#) available to help you consider and check your assessment items. Important information about the university's approach to academic integrity of assessment is on your unit Blackboard site.

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Resource materials

Learning Resources and online Modules are available open source from the [IFN001 AIRS website](#)

Recommended reading: Mewburn, Inger (2012). *How to Tame your PhD* (Thesis Whisperer Books)

Additional unit readings are available online via the AIRS website Learning Resources for enrolled students.

Risk assessment statement

There are no out-of-the-ordinary risks associated with lectures or tutorials in this unit.

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Last modified: 12-Dec-2014